

**REMARKS**

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-20 are presently active in this case. The present Amendment amends Claims 1, 3-8, 11-14 and 17-20 without introducing any new matter.

In the outstanding Office Action, Claims 1-2, 5, 8-9, 13-15 and 19 were rejected under 35 U.S.C. §102(e) as anticipated by Johnson et al. (U.S. Patent Publication No. 2005/0190812, herein "Johnson"). Claims 3, 6, 11, 17 and 20 were rejected under 35 U.S.C. §103(a) as unpatentable over Johnson in view of Jewell (U.S. Patent No. 5,881,085). Claims 4, 7, 12 and 18 were rejected under 35 U.S.C. §103(a) as unpatentable over Johnson in view of Ezaki et al. (U.S. Patent Publication No. 2003/0063649, herein "Ezaki"). Claims 10 and 16 were indicated as allowable if rewritten in independent form.

Applicants acknowledge with appreciation the indication of allowable subject matter. However, since Applicants consider that independent Claims 8 and 13, from which Claims 10 and 16 depend, defines patentable subject matter, Claims 10 and 16 are maintained in dependent form at the present time.

Initially, Applicants respectfully request that the reference AA, cited in the Information Disclosure Statement filed September 19, 2005 be acknowledged as having been considered in the next Office Action.

To clarify Applicants' invention, Claim 1 is amended to recite "including protons at an interface between the oxidized part and the non-oxidized part and without protons at an area adjacent to the side wall of the mesa." This feature finds non-limiting support in the disclosure as originally filed, for example at page 16, lines 18-20 and in Figure 1C. Independent Claims 5, 8, 13, and 19 are amended to recite a similar feature. Furthermore, Claims 1, 3-8, 11-14 and 17-20 are also amended to correct minor formalities and to better

comply with U.S. claim drafting practice. Since these changes are only formal in nature, they are not believed to raise any question on new matter.

In light of the amendments to the independent claims, Applicants respectfully request reconsideration of the rejection of Claims 1-2, 5, 8-9, 13-15 and 19 under 35 U.S.C. §102(e) and traverse the rejection, as discussed next.

Briefly recapitulating, Claim 1 relates to a vertical-cavity surface emitting laser diode including a current confinement portion having a mesa including an oxidizee layer, the oxidizee layer having an oxidized part and a non-oxidized part, the oxidized part being formed by oxidizing the oxidizee layer from a side wall of the mesa. An electric current is injected on the non-oxidized part, the oxidizee layer having a proton-containing part including protons at an interface between the oxidized part and the non-oxidized part and without protons at an area adjacent to the side wall of the mesa.

As explained in Applicants' specification at page 18, lines 4-12 with corresponding Figures 2A-2C, Applicants' Claim 1 improves upon background vertical-cavity surface emitting laser (VCSEL) diodes, because the proton implantation can control the oxidation length better. As shown in Figures 2A-2C, the oxidation rate of the oxidizee layer is remarkably decreased in a proton-implanted portion. As further explained in Applicants' specification from page 18, line 13, to page 19, line 5, controllability, uniformity and reproducibility of the size and shape of the emitting beam pattern is improved.

Turning now to the applied reference, Johnson discloses a distributed Bragg reflector for optoelectronic devices, wherein a first mirror layer has an oxidized region extending *from an edge of the Bragg reflector*, and the first mirror layer is further doped with an impurity.<sup>1</sup> However, Johnson fails to teach a proton-containing part including protons at an interface between the oxidized part and the non-oxidized part and without protons at an area adjacent

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<sup>1</sup> See Johnson in the Abstract, and in Figure 8.

to the side wall of the mesa, as recited in Applicants' Claim 1. Johnson teaches that patterned implant, shown by a dotted line 218 in Figure 8, is provided to isolate the oxide termination junctions of the aluminum bearing layers of the Bragg reflectors 180 from the active current aperture of the device."<sup>2</sup> Further, Johnson explicitly states that "an implant 218 is preferably a proton implant (H+) that extends from at least the edge 204 of the trench 198a to a location beyond the second distance 216."<sup>3</sup> Accordingly, a proton implant extending from the edge of a trench to a certain distance, as described by Johnson, *is not* a proton-containing part including protons at an interface between the oxidized part and the non-oxidized part and without protons at an area adjacent to the side wall of the mesa, as recited in Claim 1.

Therefore, the reference fails to teach or suggest every feature recited in Applicants' claims, so that Claims 1-2, 5, 8-9, 13-15 and 19 are believed to be patentably distinct over Johnson. Accordingly, Applicants respectfully traverse, and request reconsideration of, the rejection based on the Johnson.<sup>4</sup>

Regarding the rejection of Claims 3, 6, 11, 17 and 20 under 35 U.S.C. §103(a), the secondary reference Jewell does not remedy the deficiencies of Johnson. Jewell discloses a lens with at least one oxidized layer for laser cavities.<sup>5</sup> Jewell further describes that an oxidizable layer is doped with Si to decrease the rate of oxidation.<sup>6</sup> Accordingly, Jewell is also silent on the features regarding a proton-containing part, as recited in independent Claim 1. Therefore, even if the combination of the Johnson and Jewell is assumed to be proper, the

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<sup>2</sup> See Johnson at page 5, paragraph 55.

<sup>3</sup> See Johnson at page 5, paragraph 55, lines 8-12, and in corresponding Figure 8.

<sup>4</sup> See MPEP 2131: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," (Citations omitted) (emphasis added). See also MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

<sup>5</sup> See Jewell in the Abstract and in Figure 7.

<sup>6</sup> See Jewell at column 13, lines 32-67.

combination fails to teach every element of the claimed invention. Accordingly, Applicants respectfully traverse, and request reconsideration of, this rejection based on these patents.<sup>7</sup>

Regarding the rejection of Claims 4, 7, 12 and 18 under 35 U.S.C. §103(a), Applicants respectfully submit that the reference Ezaki, used by the outstanding Office Action to form the 35 U.S.C. §103(a) rejection, cannot be used as a rejection reference, since the reference Ezaki was commonly owned at the time the present invention was made. The Assignee for the Ezaki reference and the present application are both Kabushiki Kaisha Toshiba. Since the reference Ezaki is published on April 3, 2003, and the present Application was filed on November 25, 2003, Ezaki does not constitute a 35 U.S.C. §102(b) reference, and therefore Ezaki cannot be used to form a 35 U.S.C. §103(a) rejection. Accordingly, Applicants request withdrawal of the obviousness-type rejection and request the reference Ezaki be withdrawn from consideration.

Independent Claims 5, 8, 13, and 19 recite features analogous to the features recited in independent Claim 1. Moreover, Claims 5, 8, 13, and 19 have been amended in a manner analogous to the amendment to Claim 1. Accordingly, for the reasons stated above for the patentability of Claim 1, Applicant respectfully submits that the rejections of Claims 5, 8, 13, and 19, and all associated dependent claims, are also believed to be overcome in view of the arguments regarding independent Claim 1.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-20 is earnestly solicited.

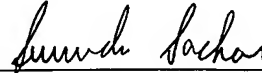
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<sup>7</sup> See MPEP 2142 stating, as one of the three "basic criteria [that] must be met" in order to establish a *prima facie* case of obviousness, that "the prior art reference (or references when combined) must teach or suggest all the claim limitations," (emphasis added). See also MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representative at the below listed telephone number.

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